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| 09/913,312 | 08/10/2001 | Thomas Krah | ALBRE-15 | 8473 |

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SHEINBERG, MONIKA B

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| ART UNIT | PAPER NUMBER |
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1634

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|---------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 09/913,312 | Applicant(s) KRAHN, THOMAS | |
| | Examiner Monika B Sheinberg | Art Unit 1634 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-9 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1 sheet. 6) ☒ Other: *Detailed Action*.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I (claims 1-4) in the amendment filed: 03 November 2003, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 5-9 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the instant response filed however as stated above, applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse.
3. Claims 1-9 are pending. Claims 1-4 are hereby examined.

Priority

The claim for foreign priority to German application, 199 07470.04 (February 2, 1999), is acknowledged. Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d), a translation of the foreign application should be submitted under 37 CFR 1.55 in reply to this action due to the intervening prior art as seen below in the rejection of claims 1, 3 and 4 under 35 U.S.C. 102(a) as being anticipated by EP 0702728. If the translation does not provide support for the claimed limitations set forth in the instant application, the noted rejection will then be reiterated under 35 U.S.C. 102(b) without affecting the finality of the case.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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6. Claim 1 is vague and indefinite due to the lack of clarity of the claim language. The claim language is grammatically confusing as to the method steps that are occurring. There is an inconsistency within the terms defining the active steps make the language confusing: dissociation versus decomposition versus 'released'. Consistent claim terminology is requested for clarification of the method steps involved. In addition, due to the confusing claim language it is unclear if the method of claim 1 is a complete separation of the double stranded DNA in to two completely separate molecules. If the claim is intended to indicate a complete separation of the double stranded DNA in to two completely separate molecules, then it is not clear from the confusing method steps in a clear positive active fashion, nor in the preamble wherein a dissociation of the strands can occur without complete dissociation into two separate nucleic acid molecules.

7. Claim 2 is vague and indefinite due to the lack of clarity of the claim language in the phrase (emphasis added) "not however separating bonds of a polymerase or leading to a temperature increase of a medium" lines 6-7. It is unclear as to whether one or both of the limitations are required for the claim. For example, an interpretation could be that only a lack of temperature increase of the medium while the separation of the bonds of polymerase would satisfy the claim limitations.

8. Claim 2 is vague and indefinite due to the lack clarity of the term "at least partly" line 4. The metes and bounds of the parameters that define 'partly' are unclear.

9. Claim 2 is vague and indefinite due to the lack of clarity of the term "preferably" line 3. It is unclear as to which range of frequencies would meet the limitations of the claim, a range of 10 GHz to 2 THz, or 30 to 79 GHz. Clarification of the intended frequency range to be embodied by the claim is requested.

10. Claim 2 is vague and indefinite due to the lack of clarity of the incomplete phrases "not separating bonds of a polymerase" lines 6-7. It is unclear what bonds of the polymerase are being referred to; in addition to what part is a polymerase playing within the method of nucleic acid strand dissociation.

11. Claim 2 is vague and indefinite due to the lack of clarity of the term "medium" line 7. It is unclear if the medium referred to, is the same as the solution in which the method is to be performed. Consistent claim language is suggested for clarity.

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12. Claim 3 is vague and indefinite due to the lack of clarity in the steps of methodology. A limitation specific to step (a) is recited as part of the last step of the body claim thus making a confusion as to the stepwise manner in which the method is to be performed. In addition it is unclear as to where the method steps of claim 1 are performed.

13. Claim 3 is vague and indefinite due to the lack of clarity of the method step (d) "return of the nucleic acids obtained in step c) into step a)" line 5. This is unclear because no physical nucleic acid has been recited to have been obtained in step c) which is insinuated by step d). Step c) only recites an elongation step of the primers.

14. Claim 4 is vague and indefinite due to the lack of clarity in the claim language "optimized to a nucleic acid synthesis speed" line 2. It is unclear as to what are the metes and bounds of the parameters that define 'speed'. In addition the claim language is grammatically confusing in that it is unclear what the claim is drawn to.

15. Claim 4 is vague and indefinite due to the lack of clarity in the method step "polymerases being optimized to a nucleic acid synthesis speed are use in step b)" lines 2-3. The claim is indefinite because step (b) of claim 3 performs primer hybridization and does not include any polymerases. The inclusion of a polymerase occurs in step (c) of claim 3.

Claim Rejections – 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Woolard et al (*J. Applied Toxicology*, 1997).

18. Woolard et al demonstrates the detection of DNA vibrational modes as a function of electromagnetic energy frequency wherein the frequency region is from 80GHz to about 1 THz (p. 244, 1st column, 2nd paragraph)(claim 2) using millimeter wave spectroscopy (see also figures 1-3). Woolard observed interactions such as "van der Waals interaction, electronic exchange

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interactions, coulombic interactions and hydrogen bonding” (p. 244, 1st column, 2nd paragraph).

Woolard et al teaches the frequency range at which the “slight displacement of the hydrogen bond distance between the base pairs” occurs (p. 243, 1st column, 2nd paragraph) (claim 1).

19. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(a) as being anticipated by EP 0702728 (Mian; 15-Aug-1998).

20. The reference EP 0702728, teaches a method of nucleic acid amplification by use of nucleic acid strand dissociation using electromagnetism for reasons that electromagnetism eliminates “conditions that destabilize polymerase enzymes”(p. 2, lines 53-54). The method of amplification as recited in claim 3 is demonstrated by the reference:

[...instant step a)...] the two strands are separated from each other by applying a magnetic field
[...instant step b)...] the separated strands are allowed to anneal to [the primers]
[...instant step c)...] the primers that are annealed [...] are extended by a polymerase
[and instant step d),...] steps [a)] through [c)] are repeated as many times as necessary to obtain a desired quantity of nucleic acid copies. (See p. 4, lines 32-40).

The polymerase utilized in step c) is taught to be a non-thermostable enzyme, a mesophilic polymerase for reasons that “[t]hese mesophilic polymerases catalyze sequence extension at a rate that is at least one and one half orders of magnitude faster than that of the known thermostable polymerases” (p. 2 lines 52-58). The use of the mesophilic polymerases demonstrates the limitation of a speedy nucleic acid synthesis as required by claim 4.

21. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 98/00562 (Purvis et al.; 8-Jan-1998).

22. WO 98/00562 teaches a method of electrical polymerase chain reaction (PCR) wherein electrochemical denaturation is utilized to cause strand dissociation as required by claim 1 (abstract, p. 24, lines 20-26; see also Example 1 and 4 on pp. 17-19). The process of isothermal amplification of a target sequence comprises “cycles of hybridisation, replication and denaturation of nucleic acid wherein said denaturation is conducted by subjecting a said nucleic acid to a voltage [...]” (p. 5, lines 18-28). With respect to hybridization the reference allows for a “temporary weakening or separation of the double helix in the primer hybridization site to

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allow the primer to bind to its target” (p. 8, lines 5-9) as required by instant claim 3, step b). Primer elongation is carried out by a polymerase such as a vent polymerase (p. 10, lines 26-34) as required by claim 3 step c). The cycles of amplification can be repeated multiple times for desired copy number, while the repeated denaturation is performed electrochemically in solution as in the original denaturation (p. 8, lines 13-22; instant claim 3 step d).

23. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 94/29484 (Mian; 22-Dec-1994).

24. The reference WO 94/29484 teaches a method of nucleic acid amplification by use of nucleic acid strand dissociation using electromagnetism for reasons that electromagnetism eliminates “conditions that destabilize polymerase enzymes”(p. 2, lines 29-30). The method of amplification as recited in claim 3 is demonstrated by the reference:

[...instant step a)..] the two strands are separated from each other by applying a magnetic field
[...instant step b)...] the separated strands are allowed to anneal to [the primers]
[...instant step c)...] the primers that are annealed [...] are extended by a polymerase
[and instant step d),...] steps [a)] through [c)] are repeated as many times as necessary to obtain a desired quantity of nucleic acid copies. (See p. 7, lines 1-12).

The polymerase utilized in step c) is taught to be a non-thermostable enzyme, a mesophilic polymerase for reasons that “[t]hese mesophilic polymerases catalyze sequence extension at a rate that is at least one and one half orders of magnitude faster than that of the known thermostable polymerases” (p. 2 line 31 to p. 3 line 5). The use of the mesophilic polymerases demonstrates the limitation of a speedy nucleic acid synthesis as required by claim 4.

Sequence Non-Compliance

25. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR § 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR § 1.821 through 1.825 because Table 1 contains nucleic acid sequences of 10 nucleotides. A Sequence Listing and a computer readable format of it must be provided with a statement that the two are identical. The sequence presented in the table must still be included in the Sequence Listing; and a

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sequence identifier (SEQ ID NO: X) must be used. Applicant(s) are given the same response time regarding this failure to comply as that set forth to respond to this office action. A complete response to this office action includes compliance with this sequence rule compliance. Failure to comply may result in abandonment of this application.

Information Disclosure Statement

26. The information disclosure statement filed: 13 November 2001, fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance of the foreign patent FR 2654000 (10 May 1991; in French), as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. The information referred to therein has not been considered.

Drawings

27. The drawings are objected to because drawings 1c and 2-5 have not been translated into English. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

28. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.961), "Sequence Listings" (37 CFR 1.821I), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or

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REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)

(e) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(f) BRIEF SUMMARY OF THE INVENTION.

(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(h) DETAILED DESCRIPTION OF THE INVENTION.

(i) CLAIM OR CLAIMS (commencing on a separate sheet).

(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Conclusion

- Translation requested of foreign priority document.
- Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph.
- Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Woolard et al.
- Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(a) as being anticipated by EP 0702728.
- Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 98/00562.
- Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 94/29484 (Mian; 22-Dec-1994).
- Sequence non-compliance.
- Information disclosure statement: FR 2654000 is not translated.
- Objection to the drawings: translation requested.
- Objection to the specification: content arrangement.

No claim is allowed.

Inquiries

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The central **Fax number is (703) 872-9306.**

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30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The central **Fax number is (703) 872-9306**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monika B. Sheinberg, whose telephone number is (571) 272-0749. The examiner can normally be reached on Monday-Friday from 9 A.M to 5 P.M. If attempts to reach the examiner by telephone are unsuccessful, the primary examiner in charge of the prosecution of this case, Jehanne Sitton, can be reached at (571) 272-0752. If attempts to reach the examiners are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached at (571) 272-0782.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Patent Analyst, Chantae Dessau, whose telephone number is (571) 272-0518, or to the Technical Center receptionist whose telephone number is (703) 308-0196.

February 23, 2004
Monika B. Sheinberg
Art Unit 1634

MBS

Jehanne Sitton
JEHANNE SITTON
PRIMARY EXAMINER

2/23/04